

“Show Me How” Video

Intravesical Electromotive Botulinum Toxin Type A (Dysport) Administration in Children With Myelomeningocele



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OBJECTIVE	Electromotive drug administration (EMDA) presents a minimally invasive method of intravesical instillation of therapeutic agents without the need for general anesthesia. ¹ It employs a combination of iontophoresis, electrophoresis, and electroporation to deliver drugs into deep tissue layers using an electrical current created between 2 electrodes. ² This video shows feasibility of botulinum toxin type A (BoNTA) EMDA in myelomeningocele children with urinary incontinence secondary to neuropathic detrusor overactivity.
METHODS	In this technique (Video 1), catheterization was performed with a 10-Fr (CE-DAS, UROGENICS/Ag 9900 (pediatric), Mirandola, Italy) catheter electrode, after providing a local transurethral anesthesia with 2% lidocaine gel. The cuff of the catheter was filled by 2 cc saline solution. The bladder was then drained and irrigated with 0.9% saline solution until the catheter outflow became clear. The bladder was subsequently filled with sterile water to its maximal capacity. BoNTA (Dysport) at a dose of 10 IU/kg was added to the intravesical solution. Negative electrode as 2 dispersive electrodes was placed on the abdomen. Positive electrode was connected to the intravesical catheter. A pulsed current generator (Physionizer 30, Physion srl, Mirandola, Italy), delivered a current with frequency of 2,800 Hz, interval of 50 μ s and amplitude of 10-20 mA for 20 minutes. At the end of the procedure, the bladder was emptied.
RESULTS	For the first time, BoNTA/EMDA was performed on myelomeningocele patients with urinary incontinence in our center. ³ According to our prior reports, urinary incontinence improved in 75% of the patients between 2 consecutive clean intermittent catheterizations at 1-year follow-up. ⁴ Mean maximal cystometric capacity significantly increased from 148 \pm 62 mL at baseline to 239 \pm 73 mL 1 year after the treatment. ⁴
CONCLUSION	This technique is a feasible, safe, reproducible, cost effective, long lasting, and pain free method, on an outpatient basis with long-term duration of effects and without anesthesia or cystoscopy procedure. UROLOGY 132: 210–211, 2019. © 2019 Elsevier Inc.

VOICE-OVER TRANSCRIPT

00:01

Intravesical electromotive Botulinum toxin type A administration in children with myelomeningocele.

00:10

Approximately 50% of children with myelomeningocele have neurogenic detrusor overactivity and detrusor sphincter dyssynergia. These underlying defects result in poor bladder compliance, urinary incontinence, high intravesical pressure, and subsequent upper urinary tract dysfunction. In patients resistant to oral anticholinergics, botulinum toxin is an appropriate alternative. The routine technique of this agent application is intravesical injection. However, it should be performed with the patient under general anesthesia and using a rigid cystoscope. Electromotive drug administration (EMDA) serves as a minimally invasive method for intravesical instillation of therapeutic agents without the need for general anesthesia. In the previous studies, urinary incontinence was improved in 75% of patients following intravesical electromotive administration of botulinum toxin A. Also, long-term follow-up revealed

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that 30% of the patients remained asymptomatic after 6 years.

01:18

EMDA employs electroporation to deliver drugs into deep tissue layers using an electrical current created between 2 positive and negative electrodes. In these phenomena, EMDA is capable of transmitting botulinum toxin A through increasing the size of available membranous pores and inducing new pore formation. This video aims to present a step-by-step guide for intravesical electromotive-botulinum toxin A administration in myelomeningocele children with neuropathic detrusor overactivity.

01:51

After prep and drape, catheterization was performed using a 10-Fr catheter containing a silver spiral electrode. The cuff of the catheter was filled with 2-cc saline solution to fix the catheter in the urethra.

02:10

The bladder was emptied and then drained and irrigated with saline solution until the catheter outflow became clear.

02:19

The bladder was subsequently filled with sterile water to its near maximal capacity.

02:29

Dysport at a dose of 10 IU/kg was added to the intravesical solution.

03:09

Negative electrodes as 2 dispersive electrodes were placed parallel below the level of umbilicus with adequate contact gel. Positive electrode was connected to the intravesical catheter.

03:27

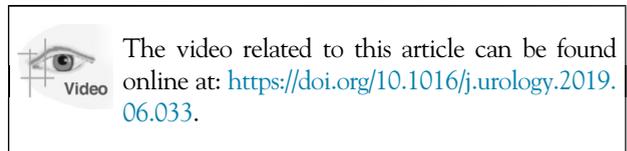
The catheter electrodes were attached to a pulsed current generator and the device was adjusted to deliver a current with frequency of 2800 Hz, interval of 50 seconds, and amplitude of 10-20 mA for 20 minutes.

03:52

At the end of the procedure, the electrodes were separated, and the bladder was emptied.

04:32

In conclusion, this technique is feasible, safe, reproducible, cost effective, long lasting and pain free, without anesthesia or cystoscopy procedure, and on an outpatient basis.



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